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XXI. *Some observations on the buffy coat of the Blood, &c.* By
JOHN DAVY, M. D. F. R. S.

Read April 18, 1822.

1. **T**HE buffy coat, as it is technically called, which appears on blood drawn from persons labouring under inflammatory disease, has been referred, by Mr. HEWSON, to two circumstances ; to increased tenuity of the blood, and to its slow coagulation.* But, in the explanation which is now usually given of the phenomenon, it is attributed to the latter circumstance, to the entire neglect of the former. The reverse of this, I believe, would be more correct ; for in cases in which the inflammatory diathesis is best marked, the separation of the red particles from the blood drawn is most rapid, often occurring in one or two minutes ; and, in some diseases, particularly in erysipelas, the blood taken from a vein coagulates as rapidly as healthy blood, and yet exhibits the buffy coat. In instances of this kind, when I have watched the coagulation of the blood, the red particles have subsided in the short space of two minutes, leaving a supernatant stratum of coagulable lymph, transparent and liquid. The buffy coat, in these instances, did not appear on the blood collected in the common bleeding cups, only when small vessels, as wine-glasses, or small gallipots were used, and quickly filled, and instantly set aside to rest. May it not, therefore, be inferred generally,

* “ An Experimental Inquiry into the Properties of the Blood, with Remarks on some of its Morbid Appearances.” By WILLIAM HEWSON, F. R. S. London, 1771, p. 56 and 59.

that the buffy coat is principally owing, not to the slow coagulation of the blood on which it appears, but to its increased tenuity; or, in other words, to the diminished viscosity of coagulable lymph, the effect of morbid vascular action connected with the inflammatory diathesis?

Mr. HEY has asserted, in opposition to Mr. HEWSON, that the coagulable lymph is not itself attenuated in inflammatory diseases, and that when it appears to be so, it is from dilution with serum.* Were this opinion correct, such blood should be of low specific gravity, which it is not, as I have satisfied myself by numerous experiments, made both in this country and in Ceylon. In general, I have found the blood, on which a buffy coat has appeared, of higher specific gravity than healthy blood.

2. It is an opinion pretty generally prevalent, that the age of these morbid adhesions, which are so frequently met with in the dissection of bodies, connecting together serous membranes, may be guessed at by their strength: thus, weak adhesions are usually considered of recent origin, and firm adhesions, of long standing. Is this opinion correct? And, does it agree with the properties of coagulable lymph, of which these adhesions are principally formed? Many circumstances, of which it will be sufficient to mention a few, lead to a reply in the negative.

Wounds, it is well known, that heal by the *first intention*, are often firmly united in twenty-four hours.

I have observed strong adhesions formed in the same space of time between the surfaces of the pleura, in consequence of inflammation artificially excited. An instance may be given.

* Observations on the Blood, by WILLIAM HEY, F. R. S. London, 1779, p. 47-49.

At Colombo, in the island of Ceylon, in January, 1819, I made the following experiment on a young dog nearly full grown. An opening was made with a scalpel between the ribs of the right side of the chest, through which about a scruple of arrack was injected into the cavity of the pleura. The lung was slightly wounded; air passed freely through the opening, and a little frothy blood was discharged. The animal, at first, seemed to suffer much pain, and to be very languid; but, left to itself, it gradually recovered, and in the course of the day took some food. At the expiration of twenty-four hours it was hot, but apparently not suffering pain; it was running about, and the wound was closed. It was now killed, and almost immediately examined. A good deal of vascular coagulated lymph was found under the skin round the wound, connecting the cutis and the intercostal muscles; the adjoining cellular membrane was inflamed; some bloody serum was effused into the right cavity of the chest; many pretty firm and long adhesions had formed between the pleura pulmonalis and costalis, both which were of a reddish hue; there were many adhesions too between the pleura and pericardium; and the pericardium was inflamed, and generally adherent to the surface of the heart.

The coagulated lymph of the buffy coat of the blood may be used as an illustration and confirmation of the short time in which strong adhesions may form. Liquid, when the blood is drawn, coagulable lymph gradually becomes, first viscid, and afterwards solid. In the viscid state, as I have frequently observed, when it is still transparent, it has the tenacity of mucus, and admits of being drawn out into fibres and bands, which, soon becoming solid and opaque, very well represent

the ordinary adhesions of the lungs ; and in a very few hours attain their maximum of strength.

This viscosity, which coagulable lymph acquires in passing from a liquid to a solid form, has not, that I am aware, been noticed by authors ; and the formation of adhesions is usually explained without reference to this quality.*

Though I believe the common opinion to be untenable, that the age of adhesions can be decided by their strength, it is far from my intention to maintain that they do not become firmer in progress of time, or that their duration may not occasionally be conjectured from their appearance and resistance.

3. It is believed by many, that the small portions of serous fluid which are found after death in the cavities of serous membranes, especially in the pericardium and the ventricles of the brain, may have been poured out after the cessation of life.† I am not aware that this opinion is other than hypothetical, or that it is supported by any precise facts. As a theoretical conclusion its correctness seems doubtful. I have endeavoured to put it to the test of experiment, and the result has not been favourable to it. I have notes of three different experiments on dogs, which were made in Ceylon in 1818, all which seem to show that, under ordinary circumstances, no effusion of serum, or exudation so as to occasion accumulation, takes place after death. The experiments were briefly the following. In each instance, a healthy dog was

* Vide "The Morbid Anatomy of some of the most important Parts of the Human Body, by MATTHEW BAILLIE, M. D. F. R. S. &c." 5th edit. p. 6.

† SAUVAGES' Nosologia Method. *Ephialtes ex Hydrocephalo*.

Cours d'Anatomie Medicale, par ANTOINE PORTAL, tom. IV. p. 54. 8vo. Paris, 1803.

suddenly killed by a blow on the occiput ; the cavity of the chest was instantly laid open, and the pericardium inspected. A small quantity of serum was found in it, which was removed with a sponge, and the incisions made were closed by sutures. At the end of twenty-four hours the sutures were divided, and the pericardium was again examined. Not a single drop of fluid had collected in it, in any instance, though in two of the trials the right auricle and ventricle were considerably distended with blood.

If these results be conclusive against fluid being effused into the pericardium after death in dogs, the conclusion from them, admits of being extended by analogy to other cavities of the same texture, and to man ; and I am not acquainted with any pathological observations in opposition to it. The discovery of serous effusions in examinations *post mortem*, no symptoms of their occurrence or existence having been noticed during life, is surely no evidence of their having taken place after the cessation of vital action. It is too well known to be insisted on, that large portions of fluid may accumulate in the pericardium, and even in the ventricles of the brain, without a single symptom to indicate the fact.

Fort Pitt, Chatham,

March 5, 1822.